

## **AMENDMENTS TO THE CLAIMS**

This listing of claims replaces prior versions, and listings, of claims in the application:

### **Listing of Claims**

- 5     1. **(CANCELLED)** Integrated biosensor and simulation system comprising:
- a sensor for sensing a biological target to generate a signal; and
- a simulator for using the signal and a model of the target to generate a therapeutic or
- diagnostic output.
- 10    2. **(CANCELLED)** The system of claim 1 wherein:
- the sensor is reconfigurable by the simulator.
3. **(CANCELLED)** The system of claim 1 wherein:
- the sensor senses a food material for consumption by the biological target to generate a
- 15    second signal, the simulator further using the second signal to generate the therapeutic
- or diagnostic output.
4. **(CANCELLED)** The system of claim 1 wherein:
- the simulator generates the output according to a regulatory condition.
- 20    5. **(CANCELLED)** The system of claim 1 wherein:
- the sensor couples to the simulator via a programmable switch.

6. **(CANCELLED)** Automated sensor and simulation method comprising the steps of:
- sensing a biological target to generate a signal; and
  - simulating using the signal and a model of the target to generate a therapeutic or diagnostic output.

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7. **(CANCELLED)** The method of claim 6 wherein:

- a simulator for simulating reconfigures a sensor for sensing.

8. **(CANCELLED)** The method of claim 7 wherein:

10        the sensor senses a food material for consumption by the biological target to generate a second signal, the simulator further using the second signal to generate the therapeutic or diagnostic output.

9. **(CANCELLED)** The method of claim 7 wherein:

15        the simulator generates the output according to a regulatory condition.

10. **(CANCELLED)** The method of claim 7 wherein:

- the sensor couples to the simulator via a programmable switch.

- 20    11. **(WITHDRAWN)** Implantable network-biosensor comprising:

- a sensor unit for receiving a multi-sensor signal from a biosensor platform for detecting a biological material of a host; and

a controller for processing a systems-biology platform for verifying or modifying a simulation model associated with the biological material.

12. **(WITHDRAWN)** The network biosensor of claim 11 wherein:

5       the sensor unit is configurable or programmable for detecting multi-sensor signaling, thereby enabling the biosensor platform to access one or more sensor signals from the group consisting essentially of a DNA or RNA sensor, a peptide or protein sensor, an antibody or antigen sensor, a vector or virus-vector sensor, a lipid or fatty-acid sensor, and an inorganic-ion or electrochemical sensor.

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13. **(WITHDRAWN)** The network biosensor of claim 11 wherein:

the sensor unit is configurable or programmable for detecting multi-sensor signaling, thereby enabling the biosensor platform to access one or more sensor signals from the group consisting essentially of a tissue-factor sensor, a steroid sensor, a

15       neurotransmitter sensor, a pH sensor, a free-radical sensor, a carbohydrate sensor, a neural sensor, a chemical sensor, a small-molecule sensor, an exon sensor, a metabolites sensor, an intermediate sensor, a chromosome sensor, and a cell sensor.

14. **(WITHDRAWN)** The network biosensor of claim 11 wherein:

20       the sensor unit comprises a positioning chip for immobilizing or positioning the biological material for sensing thereof.

15. **(WITHDRAWN)** The network biosensor of claim 11 wherein:

the sensor unit receives another multi-sensor signal from another biosensor platform for detecting another biological material of the same or another host.

16. **(WITHDRAWN)** The network biosensor of claim 11 wherein:

5       the controller is configurable or programmable for processing multiple simulation applications, thereby enabling the systems-biology platform to access one or more simulation models from the group consisting essentially of a genomics model, a proteomics model, a computational chemistry model, a pharmacogenomics model, a computational biology model, a computational biophysics model, a computational cell  
10       behavior model, a pharmacokinetics model, a metabolomics model, and a transcriptomics model.

17. **(WITHDRAWN)** The network biosensor of claim 11 wherein:

15       the controller is configurable or programmable for processing multiple simulation data, thereby enabling the systems-biology platform to access one or more simulation data from the group consisting essentially of a genetic-disorder or mutation data, an infectious disease or infection data, an immunity-disease data, a single-organ or cell-type autoimmune disease data, and a neoplasia data.

20   18. **(WITHDRAWN)** The network biosensor of claim 11 further comprising:

a therapeutic unit for releasing or dispensing a therapeutic material from a reservoir in or onto the host, whereby the sensor unit may automatically detect an effect of the therapeutic material on the host.

19. **(WITHDRAWN)** The network biosensor of claim 18 wherein:

the therapeutic unit is configurable or programmable for releasing or dispensing the therapeutic material alternatively from manufacture means, thereby enabling the systems-biology platform to instruct the therapeutic unit configurably or programmably using one or more manufacture-means components from the group consisting essentially of pharmaceuticals, biopharmaceuticals, reconfigurable biocatalytic chips, tissue scaffolds, and micro or nano-array or electro-mechanical tools.

20. **(WITHDRAWN)** The network biosensor of claim 11 wherein:

the controller processes the systems-biology platform adaptively for generating a diagnostic or therapeutic signal or report, whereby the systems-biology platform may access one or more simulation applications from the group consisting essentially of a neural or learning network, a statistical or probabilistic expert, fuzzy-logic or knowledge-based system, an artificial intelligence or decision-making inference-engine or program, and a supervised or unsupervised Bayesian or Markovian analysis, clustering, criterion or classification program.

21. **(NEW)** Sensor apparatus comprising:

a multi-functional array coupled programmably to a peptide or protein sensor, an antibody sensor, a carbohydrate sensor, and a cell sensor.

22. **(NEW)** The apparatus of claim 21 wherein:

the sensor array comprises a reconfigurable hardware switch logically interconnecting a plurality of biosensors to a networked controller.

23. (NEW) The apparatus of claim 21 further comprising:

5 a positioning chip, coupled to one or more of the array sensors.

24. (NEW) The apparatus of claim 23 wherein:

the positioning chip comprises a patch clamp.

10 25. (NEW) The apparatus of claim 21 wherein:

the peptide or protein sensor comprises an electrophoresis tag or micro-assay, or protein chip.

26. (NEW) The apparatus of claim 21 wherein:

the antibody sensor comprises a phagotope biochip.

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27. (NEW) The apparatus of claim 21 wherein:

the sensor array couples further to a vector or virus vector sensor comprising a micro-array or assay with known sequenced virus attached, or a micro-array or assay that detects homologs.

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28. (NEW) The apparatus of claim 21 wherein:

the carbohydrate sensor comprises a glycochip, or a whole blood glucose monitoring system.

29. (NEW) The apparatus of claim 21 wherein:

the cell sensor comprises a bionic chip for cell-growth.

5 30. (NEW) The apparatus of claim 21 further comprising:

a therapeutic unit comprising a pill comprising a micro-pump, a polymer scaffold comprising hydrogel, or an implantable bio-MEMs chip comprising a medication reservoir, such unit being coupled to at least one sensor.

10 31. (NEW) The apparatus of claim 21 wherein:

the sensor array couples further to a DNA sensor comprising a micro-array or assay.

32. (NEW) The apparatus of claim 31 further comprising:

15 a controller comprising a systems-biology platform that determines automatedly when the DNA sensor detects a genomic mutation indicating compromised ability to produce thiopurine S-methyltransferase enzyme.

33. (NEW) Sensor apparatus comprising:

20 a multi-functional array coupled programmably to a peptide or protein sensor, an antibody sensor, a carbohydrate sensor, or a cell sensor;  
a positioning chip, coupled to one or more of the array sensors;

a therapeutic unit comprising a pill comprising a micro-pump, a polymer scaffold comprising hydrogel, or an implantable bio-MEMs chip comprising a medication reservoir; and

a controller that controls the therapeutic unit or the sensor array.

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34. (NEW) Sensor apparatus comprising:

a multi-functional array coupled programmably to a peptide or protein sensor, an antibody sensor, a carbohydrate sensor, or a cell sensor;

wherein the peptide or protein sensor comprises an electrophoresis tag or micro-assay,

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or protein chip; the antibody sensor comprises a phagotope biochip; the carbohydrate sensor comprises a glycochip, or a whole blood glucose monitoring system; and the cell sensor comprises a bionic chip for cell-growth.

35. (NEW) The apparatus of claim 34 wherein:

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the sensor array couples further to a vector or virus vector sensor comprising a micro-array or assay with known sequenced virus attached, or a micro-array or assay that detects homologs; and to a DNA sensor comprising a micro-array or assay.